

What is claimed is:

- 1 1. A method for forming gate structures with narrow
2 spacings, comprising the steps of:
3 providing a substrate;
4 successively forming a dielectric layer, a polysilicon
5 layer, and a capping layer on the substrate;
6 forming a plurality of silicon islands on the capping
7 layer;
8 oxidizing the silicon islands to form an oxide layer on
9 the sidewall and the upper surface of each
10 silicon island;
11 forming a masking layer in each gap between the
12 oxidized silicon islands;
13 removing the oxide layers to form a narrow opening
14 between each of the silicon islands and the
15 masking layers, having a width substantially
16 equal to the thickness of the removed oxide
17 layer;
18 successively etching the cap layer and the polysilicon
19 layer underlying the narrow openings to form the
20 gate structures with narrow spacings on the
21 substrate; and
22 removing the silicon islands, the masking layers, and
23 the capping layer.
- 1 2. The method as claimed in claim 1, wherein the
2 capping layer is a silicon nitride layer.

1 3. The method as claimed in claim 1, wherein the
2 masking layer is a photoresist layer.

1 4. The method as claimed in claim 1, wherein the
2 masking layer is a silicon layer.

1 5. A method for forming narrow trench structures,
2 comprising the steps of:

3 providing a substrate covered by a layer to be defined;
4 forming a plurality of oxidable first masking islands
5 on the layer to be defined;
6 oxidizing the first masking islands to form an oxide
7 layer on the sidewall and the upper surface of
8 each first masking island;
9 forming a second masking island in each gap between the
10 oxidized first masking islands;
11 removing the oxide layers to form narrow openings
12 between the first and second masking islands,
13 each one having a width substantially equal to
14 the thickness of the removed oxide layer;
15 etching the layer to be defined underlying the narrow
16 openings to form the narrow trench structures on
17 the substrate; and
18 removing the first and second masking islands.

1 6. The method as claimed in claim 5, further forming
2 a capping layer on the layer to be defined before forming
3 the first masking islands.

1 7. The method as claimed in claim 6, wherein the
2 capping layer is a silicon nitride layer.

1 8. The method as claimed in claim 6, wherein the
2 layer to be defined is a silicon layer.

1 9. The method as claimed in claim 6, wherein the
2 layer to be defined is a metal layer.

1 10. The method as claimed in claim 5, wherein the
2 layer to be defined is a dielectric layer.

1 11. The method as claimed in claim 5, wherein the
2 first masking island is silicon.

1 12. The method as claimed in claim 5, wherein the
2 second masking island is photoresist.

1 13. The method as claimed in claim 5, wherein the
2 second masking island is silicon.